

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-19. (canceled)

20. (currently amended) A system for enhancing minimally invasive heart surgery, the system comprising:

at least one retractor device for enhancing access to a patient's heart through a first incision;

a heart stabilizing device having a tissue contacting surface and at least one suction aperture adjacent the surface;

a source of suction; and

a first coupling device for coupling with the heart stabilizing device through a second incision at a location on the patient apart from the first incision, the first coupling device comprising:

an elongate shaft having a proximal end, a distal end, and at least one flexible, rigidifying portion ~~having a closed section~~ that can be rigidified by applying suction; and

means for coupling the elongate shaft with the heart stabilizing device adjacent the distal end of the elongate shaft,

wherein the source of suction is attached with the coupling device and applies a vacuum to the flexible, rigidifying portion of the elongate shaft.

21. (original) A system as in claim 20, further comprising:

a heart positioning device having a tissue contacting surface and at least one suction aperture; and

a second coupling device for coupling with the heart positioning device through a third incision at a location on the patient apart from the first and second incisions.

22. (previously presented) A system as in claim 21, wherein the first and second coupling device comprises devices each comprise an elongate shaft having a proximal end, a distal end, and at least one flexible, rigidifying portion that can be rigidified by applying suction, and means for coupling the elongate shaft with the heart stabilizing device or the heart positioning device adjacent the distal end of the elongate shaft.

23. (previously presented) A system as in claim 22, wherein the means for coupling the elongate shaft of the first coupling device comprises a collet or socket for coupling with a ball on the heart stabilizing device, and the means for coupling the elongate shaft of the second coupling device comprises a collet or socket for coupling with a ball on or the heart positioning device.

24. (withdrawn) A system as in claim 23, wherein each of the first and second coupling devices further include a tightening device adjacent the proximal end of the shaft, for tightening the collet or socket around the ball.

25. (withdrawn) A system as in claim 22, wherein the means for coupling comprises a slot for coupling with a surface feature on the heart stabilizing device or the heart positioning device.

26. (withdrawn) A system as in claim 22, wherein the means for coupling comprises threads for coupling with complementary threads on the heart stabilizing device or the heart positioning device.

27. (withdrawn) A system as in claim 22, wherein the means for coupling comprises a clamp for coupling with the heart stabilizing device or the heart positioning device.

28. (withdrawn) A system as in claim 22, wherein the elongate shaft comprises at least one flexible joint between the proximal end and the distal end.

29. (withdrawn) A system as in claim 28, wherein the at least one flexible joint comprises at least one collet or socket and ball joint.

30-31. (canceled)

32. (original) A system as in claim 21, further comprising:
a first flexible arm for coupling the first coupling device with at least one stable object; and

a second flexible arm for coupling the second coupling device with the at least one stable object.

33. (original) A system as in claim 32, wherein the first and second flexible arms may be rigidified after coupling the first and second coupling devices with the stable object.

34. (original) A system as in claim 32, wherein the at least one stable object comprises at least one part of an operating room table.

35. (withdrawn) A system as in claim 32, wherein each of the first and second flexible arms comprises:

an elongate arm having a proximal end, a distal end and at least one joint disposed between the proximal end and the distal end;

means near the distal end for coupling the arm with a coupling device;

means near the proximal end for coupling the arm with the stable object; and

means for rigidifying the at least one joint of the arm.

36. (withdrawn) A system as in claim 35, wherein the means near the distal end and the means near the proximal end each comprises a clamp.

37. (original) A system as in claim 20, wherein the at least one retractor device comprises:

a retractor frame for movably holding at least two retractor blades;

at least two retractor blades coupled with the retractor frame, for retracting tissue adjacent an incision; and

means for moving the retractor frame so as to move the blades to retract the tissue.

38. (original) A system as in claim 37, wherein each of the at least two retractor blades includes nerve protection means for inhibiting damage to an intercostal nerve when retracting a rib.

39. (original) A system as in claim 37, wherein the means for moving the retractor frame comprises a crank handle.

40. (original) A system as in claim 20, wherein the heart stabilizing device comprises:

at least one tissue contacting surface;

at least one suction aperture for applying suction force to enhance contact between the tissue contacting surface and heart tissue; and

at least one suction port for connecting with a source of suction.

41. (currently amended) A device for enhancing minimally invasive heart surgery, the device comprising:

a surgical tool comprising a ball;

a source of suction; and

an elongate coupling member having a proximal end, a distal end, a flexible rigidifying portion that can be rigidified by applying suction, and means near the distal end for coupling with the surgical tool, and an actuation device near the proximal end that can tighten the coupling means to the ball of the surgical tool and loosen the coupling means from the ball of the surgical tool,

wherein the source of suction is attached with the elongate coupling member and applies a vacuum to the flexible rigidifying portion.

42. (original) A device as in claim 41 wherein the surgical tool is a heart stabilizing member.

43. (original) A device as in claim 42, wherein the heart stabilizing member comprises:

at least one tissue contacting surface;
at least one suction aperture for applying suction force to enhance contact between the tissue contacting surface and heart tissue; and
at least one suction port for coupling with a source of suction.

44. (original) A device as in claim 42, wherein the heart stabilizing member comprises:

at least one inflatable tissue contacting surface; and
at least one port for allowing inflation of the tissue contacting surface.

45. (previously presented) A device as in claim 42, wherein the means for coupling with the heart stabilizing member comprises a collet or socket for coupling with the ball on the heart stabilizing member.

46. (withdrawn) A device as in claim 42, wherein the means for coupling with the heart stabilizing member comprises a clamp.

47. (withdrawn) A device as in claim 42, wherein the means for coupling with the heart stabilizing member comprises a slot for coupling with a surface feature on the heart stabilizing device or the heart positioning device.

48. (withdrawn) A device as in claim 42, wherein the means for coupling with the heart stabilizing member comprises threads for coupling with complementary threads on the heart stabilizing device or the heart positioning device.

49. (withdrawn) A device as in claim 42, wherein the means for coupling with the heart stabilizing member comprises a clamp.

50. (withdrawn) A device as in claim 42, wherein the elongate coupling member further includes at least one flexible joint between the proximal end and the distal end.

51. (withdrawn) A device as in claim 50, wherein the at least one joint comprises a collet or socket and ball joint.

52. (withdrawn) A device as in claim 50, wherein the at least one joint comprises multiple flexible beads.

53. (original) A device as in claim 41 wherein the surgical tool is a heart positioning member.

54. (original) A device as in claim 53, wherein the heart positioning member comprises:

at least one tissue contacting surface;

at least one suction aperture for applying suction force to enhance contact between the tissue contacting surface and heart tissue; and

at least one suction port for connecting with a source of suction.

55. (original) A device as in claim 53, wherein the heart positioning member comprises:

at least one inflatable tissue contacting surface; and

at least one port for allowing inflation of the tissue contacting surface.

56. (original) A device as in claim 53, wherein the means for coupling with the heart positioning member comprises a collet or socket for coupling with a ball on the heart positioning member.

57. (withdrawn) A device as in claim 53, wherein the means for coupling with the heart positioning member comprises a clamp.

58. (withdrawn) A device as in claim 53, wherein the elongate coupling member further includes at least one flexible joint between the proximal end and the distal end.

59. (withdrawn) A device as in claim 58, wherein the at least one joint comprises a collet or socket and ball joint.

60. (withdrawn) A device as in claim 58, wherein the at least one joint comprises multiple flexible beads.

61. (withdrawn) A device as in claim 41 wherein the surgical tool comprises:
at least one inflatable tissue contacting surface; and
at least one port coupled with the tissue contacting surface for allowing inflation of the surface.

62. (previously presented) A system as in claim 20, further comprising a flexible arm coupled with the first coupling device, wherein the flexible arm can be rigidified by applying suction.

63. (previously presented) A system as in claim 20, further comprising an actuation device coupled with the first coupling device, and a distal coupling means that couples the coupling device with the heart stabilizing device, wherein the actuation device can tighten and loosen the distal coupling means.

64. (previously presented) A system as in claim 63, further comprising a flexible arm coupled with the first coupling device, wherein the flexible arm can be rigidified by applying suction.

65. (canceled)

66. (previously presented) A device as in claim 41, further comprising a flexible arm coupled with the elongate coupling member, wherein the flexible arm can be rigidified by applying suction.

67. (currently amended) A system for enhancing minimally invasive heart surgery, the system comprising:

a retractor device;

a source of suction;

a heart stabilizing device comprising a tissue contacting surface, a suction aperture adjacent the tissue contacting surface, and a complementary coupling means;

a first coupling device comprising an elongate shaft having a proximal end, a distal end, and at least one flexible rigidifying portion ~~having a closed section~~ that can be rigidified by applying suction, a distal coupling means at or near the distal end, and an actuation device at or near the proximal end that can tighten the distal coupling means relative to the complementary coupling means of the heart stabilizing device and that can loosen the distal coupling means relative to the complementary coupling means of the heart stabilizing device;
and

a first flexible arm coupled with the first coupling device via a first clamp, wherein the first flexible arm can be rigidified by applying suction,

wherein the source of suction is attached with the coupling device and applies a vacuum to the flexible rigidifying portion.

68. (previously presented) A system as in claim 67, further comprising:

a heart positioning device comprising a tissue contacting surface, a suction aperture adjacent the tissue contacting surface, and a complementary coupling means;

a second coupling device comprising an elongate shaft having a proximal end, a distal end, and at least one flexible rigidifying portion that can be rigidified by applying suction, a distal coupling means at or near the distal end, and an actuation device at or near the proximal end that can tighten the distal coupling means relative to the complementary coupling means of the heart positioning device and that can loosen the distal coupling means relative to the complementary coupling means of the heart positioning device; and

a second flexible arm coupled with the second coupling device via a second clamp, wherein the second flexible arm can be rigidified by applying suction.